

Claims

- 1 SubA1> 1. A time-shifted video method comprising
2 in a real-time mode, delivering real-time video
3 frames for display,
4 in a time-shifted mode, delivering time-shifted
5 video frames for display, the time-shifted video frames
6 being delayed relative to the real-time video frames, and
7 pausing a real-time frame in a transition from the
8 real-time mode to the time-shifted mode.
- 1 2. The method of claim 1 in which the transition
2 is between the paused real-time frame and a time-shifted
3 version of the paused real-time frame.
- 1 3. The method of claim 1 further comprising
2 providing trick functions during the time-shifted mode.
- 1 4. The method of claim 1 in which the transition
2 mode is triggered by a command of a viewer or an event
3 generated by software.
- 1 5. The method of claim 1 in which the real-time
2 video frames are derived from input uncompressed video.
- 1 6. The method of claim 5 in which the real-time
2 video frames are provided from an input frame buffer.
- 1 7. The method of claim 1 in which the real-time
2 video frames are derived from input compressed video.
- 1 8. The method of claim 7 in which the real-time
2 frames are provided from a decoder that decompresses the
3 input compressed video.
- 1 9. The method of claim 1 in which the real-time
2 mode, the time-shifted mode, and the transition are provided
3 by a single codec chip.
- 1 10. The method of claim 8 in which the compressed
2 video comprises MPEG video.

1 11. The method of claim 1 in which information is
2 stored identifying the paused frame, and before the time-
3 shifted mode occurs, the predetermined frame or the next
4 frame after the predetermined frame is queued up.

1 12. Video apparatus comprising
2 a port to receive an input video signal,
3 a time-shifted processing path that stores
4 compressed video frames based on the input video signal and
5 delivers time-shifted stored video frames to an output,
6 a real-time processing path that delivers real-time
7 video to the output based on the input video signal, and
8 control circuitry that controls transitions between
9 the real-time video frames and the time-shifted video frames
10 at the output.

1 13. The apparatus of claim 12 in which the
2 processing paths include two decoders.

1 14. The two decoders are provided in a single
2 codec.

1 15. The apparatus of claim 12 in which the
2 processing paths include an encoder and a decoder.

1 16. The apparatus of claim 12 in which the encoder
2 and decoder or decoders are provided in a single codec.

1 17. The apparatus of claim 12 in which the
2 processing paths include buffers and the buffers are
3 provided by a common memory.

1 18. The apparatus of claim 12 in which the video
2 apparatus comprises a set-top box.

1 19. The apparatus of claim 12 in which the video
2 apparatus comprises an analog television receiver.

20. A set-top box comprising
a compressed digital video input,
a display video output,
a real-time decoder coupled to the input and the
output,
a frame storage system coupled to the input, a time-
shifted decoder coupled to the frame storage system and the
output, and
a controller coupled to the time-shifted decoder,
the storage system, and the output.

21. An analog television receiver comprising
an uncompressed video input,
a display video output,
a frame buffer coupled to the input and the output,
a frame storage system coupled to the input,
a time-shifted decoder coupled to the output, and
a controller coupled to the time-shifted decoder,
the storage system, and the output.

22. A set-top box comprising
a compressed digital video input,
an uncompressed video input,
a display video output,
a real-time decoder coupled to the input and the
output,
a frame storage system coupled to the input,
a time-shifted decoder coupled to the frame storage
system and the output, and
a controller coupled to the time-shifted decoder,
the storage system, and the output.

ADD C4

ADD DI